UPPER DESCHUTES RIVER BASIN STUDY
PROJECT MANAGEMENT PLAN

Version 1.0

October 19, 2015

VERSION HISTORY

The Project Management Plan (PMP) will be updated/revised as the project proceeds to reflect refined understandings and/or new information as work proceeds. Changes to the PMP will be approved by the Technical Director and Reclamation's Project Manager. Prior concurrence will be sought from Reclamation's Bend Field Office Manager and the BSWG Planning Team and Steering Committees for significant changes/updates per their discretion.

Version #	Implemented By	Revision Date	Approved By	Approval Date	Reason
1.0	Mike Relf, Niklas Christensen, Kate Fitzpatrick		Planning Team	10/19/15	Establishment of initial PMP

UP Template Version: 11/30/06

TABLE OF CONTENTS

1 INTRODUCTION

1.1 PURPOSE OF PROJECT MANAGEMENT PLAN

The intended audience of the Upper Deschutes River Basin Study (Study) PMP is all project stakeholders including the BSWG Steering Committee and Planning Team, Reclamation management, and the Study team. The PMP is a working document designed to facilitate implementation of the Study in accordance with the May 5, 2015 Plan of Study (POS).

2 EXECUTIVE SUMMARY OF PROJECT CHARTER

The Study has been authorized through the May 5, 2015 Memorandum of Agreement between the Deschutes Basin Board of Control (acting as the fiscal agent for BSWG) and Reclamation. The MOA incorporates the POS which defines charter-level objectives, scope, schedule, budget, and study team.

2.1 ASSUMPTIONS/CONSTRAINTS

No changes in the POS assumptions/constraints are noted at this time.

3 SCOPE MANAGEMENT

The Study scope will be managed by reference to the POS tasks as a baseline and by implementing the change management process described in Section 3.2.

3.1 OVERVIEW OF STUDY SCOPE AND APPROACH

The Study scope is meant to fulfill the general objectives of the Upper Deschutes River Basin Study as identified in the MOA, and as follows:

- Build off the solid foundation of prior studies to develop a comprehensive analysis of water supply and demand, integrating and updating the analyses to account for climate change
- Analyze how existing operations and infrastructure will perform under the projected future water supply conditions and demands (unless otherwise noted, demands refers to instream and out of stream demands).
- Collaboratively develop and evaluate options for addressing identified water imbalances, providing a common understanding of the interconnected effects of options that address imbalances.
- Complete a tradeoff analysis to compare relative cost, environmental impact, risk, stakeholder response, and other common attributes of identified options. While the study will not propose any specific project, program, or plan, it will provide a current and broadly-shared basis for future water management in the basin.

To fulfill these objectives, the Study will generate a holistic assessment of the Basin's water resources system. This is accomplished through analysis of the individual parts of the system, and subsequently bringing all of the individual pieces of the system together in a water resource model to evaluate the interconnectedness and trade-offs of water

management scenarios. The overarching goal is to meet instream and out of stream water demands into the future in the most efficient, cost-effective way.

Generally, individual work elements will be either inputs into the water resources model (e.g. existing water use tells the model how much water to divert for a particular user); water resource alternatives (e.g. an individual action that can impact water supply or demand is a water resource alternative), or metrics (e.g. flow-temperature relationships input into the water resource model help assess ecological benefits of various water management scenarios). Additionally, water resource scenarios will be created by grouping together two or more water resource alternatives (with the BSWG deciding which water resource alternatives will be combined into a water resource scenario). Attachment 1 is a conceptual overview illustrating the interactions and critical dependencies between work elements.

A major focus of the study will be developing water supply alternatives and packaging these together in ways that meet multiple needs efficiently. Water resource alternatives will be generated through individual work elements including the water conservation assessment, reservoir optimization assessment, storage assessment, and evaluation of water transactions. Because of the interconnected nature of water management in the Deschutes, individual alternatives will likely have specific impacts and benefits that may not meet basin goals on their own. The strategic packaging and evaluation of suites of water resource alternatives will likely be the key to meeting multiple needs. In addition, the technical analysis of water resources alternatives needs to be integrated with the legal, policy and socioeconomic analysis to understand both how to implement alternatives and how to link alternatives together (including moving water between uses and users) to achieve outcomes. The Study Team, with BSWG and Reclamation input, will use the information produced in these work elements to develop water resource scenarios to run through the water resource model. Water resource scenario(s) will be developed to address two broad objectives, one to focus on solving baseline needs in the short-term with lower-cost, lower-barrier solutions, and one to optimize benefits over the longer-term at higher cost.

The water resource model will generate outputs that indicate how well the water resource scenarios meet water demands and ecological conditions, as well as to assess the effects of the water resource scenarios themselves. Once these results are available, the Study Team, BSWG, and Reclamation will evaluate them along with the associated economic, social and legal information. Together, this information should provide stakeholders with a solid foundation for the collaborative development of a water management plan.

Study Element Definitions

Climate Scenarios: The hydrology and water resource models will be run with one "historical" and multiple "future" climate scenarios. The historical climate will be based on the period from 1980-2010. For the "future" climate scenarios, ten climates will be evaluated in the hydrology model. These ten are five from the period 2030-2060 and five

from the period 2060-2090. It is anticipated that just three of the "future" climates from the 2030-2060 period will be carried forward into the water resource model

Water Resource Alternative: An individual action that impacts water supply or water demand. For example, piping an open irrigation canal, expanding an existing reservoir, or conversion of irrigation from flood to center-pivots will all either reduce water use or make additional supply available. Water resource alternatives are identified in the "individual analysis" part of the work structure described below.

Water Resource Scenario: A grouping of multiple individual water resource alternatives that may get implemented together in the future. The water resource scenarios are essentially a 'suite' or water resource alternatives that get implemented together in the water resource model.

Flow Scenario: A run of the water resource model with specific target flows. For example, the water resource model could be run with releases below Wickiup set at a range of flows (ex. 150; 300; 500) to better define the scale of water resource alternatives necessary to meet flow targets and continue to meet out of stream needs.

3.2 WORK BREAKDOWN STRUCTURE

The Study Overview flow chart is shown in Attachment 1, and the Study Work Elements are shown in Attachment 2 along with associated schedules and budgets. The Study Elements depicted in the flow chart in Attachment 1 are summarized below to establish a baseline reference. Additional task-specific work breakdown structures will be developed to supplement the task schedules/budgets shown in Attachment 2 and added to the PMP, as appropriate, as task-specific work is initiated.

3.2.1 Study Element: Historical Climate

Performed by: Reclamation, with BSWG review/input

Individual Analysis: The Basin Study will use observed precipitation and temperature from the period 1980-2010 as the historical climate. This will serve as the 'baseline' or 'existing' conditions within the basin for temperature, precipitation, and natural streamflow.

Interaction with the Water Resource Model: The historical precipitation and temperature timeseries will be input to the hydrology model which will then generate historical streamflow for the same period. The historical streamflow needs to be generated in this manner (observed temperature and precipitation being input into a hydrology model to obtain streamflow) for two reasons; 1) future (2030-2060s) streamflow will be generated from the hydrology model, so historical streamflow needs to be as well to minimize any impacts from model bias, and 2) we need streamflow timeseries at locations in the Basin where no gauges exists (e.g., at the Upper Deschutes Ecological Assessment reaches), hence we need modeled streamflow so we can simulate it at any point within the Basin.

3.2.2 Study Element: Climate Change Analysis

Performed By: Reclamation, with BSWG review/input

Individual Analysis: This element will determine projected future precipitation and temperature for the Deschutes Basin for five scenarios each for the years 2030-2060 and 2060-2090 based on the 20/50/80 percentiles projections from the CMIP5 data set.

Interaction with Water Resource Model: It is anticipated that BSWG and Reclamation will select three climate scenarios from the 2030-2060 time period for further analysis. Using these datasets as input, the hydrology model will generate daily streamflow timeseries at approximately 30 points of interest within the Basin which will then be input to the water resource model. Using the streamflow timeseries from the climate change scenarios (as opposed to streamflow from the historical 1980-2010 period) will allow evaluating the Basin's water resources under future conditions.

3.2.3 Study Element: Groundwater / Surface Water Model

Performed by: Reclamation, with BSWG review/input

Individual Analysis: It is anticipated that the Basin Study will use the USGS's GSFlow hydrology model. This model will use both the historic climate (1980-2010) and future climates (2030-2060) to simulate snowpack, groundwater and surface water runoff within the Basin. A comparison of the results (future versus existing) from this model will be used to evaluate the hydrologic impacts of climate change in the Basin.

Interaction with the Water Resource Model: Streamflow timeseries output from the hydrology model will be used as the primary input (driver) of the water resource model. The water resource model will be calibrated/validated with existing (1980-2010) streamflow, and then used with the future climate to evaluate the impacts of climate change on the water resource system.

3.2.4 Study Element: Water Use (existing and future)

Performed by: Water Rights, Policy, Legal, and Socio-Economic Consultant, with Reclamation review/input

Individual Analysis: This work element will document existing water use in the Basin based on previous studies, OWRD Water Use Reports, and other. This includes all municipal, irrigation, hydropower, and other major water uses. This element will also project future municipal and irrigation water use for the years 2030-2060 and will inform a Needs Assessment technical memorandum. Municipal use projections will be based primarily on population estimates and irrigation use will be based primarily on increased crop evapotranspiration due to increased temperatures.

Interaction with the Water Resource Model: The baseline (existing conditions) water resource model will be built with existing water use as one of the major inputs. To assess projected future conditions in the Basin, the water resource model will be updated (ran) with future withdrawals.

3.2.5 Study Element: Water Rights

Performed by: Water Rights, Policy, Legal, and Socio-Economic Consultant, with Reclamation review/input

Individual Analysis: Similar to work element Water Use, this element will document all existing water rights in the Basin.

Interaction with the Water Resource Model: Existing water rights will be used to build the water resource model, thereby allowing simulated diversions in the model to be constrained by the applicable water right.

3.2.6 Study Element: Storage Assessment

Performed by: Reclamation, with review/input from BSWG/Technical Director

Individual Analysis: This element will include reconnaissance-level assessments to evaluate potential new or expanded reservoir storage sites in the Upper Deschutes and the Crooked River basins. It is anticipated that one, most promising storage location from the Upper Deschutes Basin (potentially the Monner Reservoir site) will be evaluated in further planning-level detail. Additional smaller sites within irrigation district boundaries will also be evaluated as possible per budget constraints. The site-specific planning-level analysis will include storage volume estimates, required infrastructure, and planning level cost estimates.

Interaction with the Water Resource Model: Each potential new or expanded storage sites is a water resource alternative that could be packaged into scenarios to be evaluated in the water resource model. As with other potential water resource alternatives, BSWG and Reclamation will decide which of the sites evaluated under this work element will be evaluated further in the water resource model.

3.2.7 Study Element: Reservoir Optimization

Performed by: Reclamation and Technical Director with input from OWRD and Water Rights, Policy, Legal, and Socio-Economic Consultant

Individual Analysis: This element will evaluate opportunities to optimize the management of existing reservoirs to increase system efficiencies and/or increase water supplies, including operating the reservoirs as one system. This element will require coordination with the Water Rights, Legal, Policy and Socioeconomic Consultant(s) who will be evaluating associated legal and policy issues.

Interaction with the Water Resource Model: Optimization options are water resource alternatives that could be packaged into scenarios to be evaluated in the water resource model. BSWG and Reclamation will decide which options will be evaluated further in the water resource model.

3.2.8 Study Element: Water Conservation Assessment #1

Performed by: Water Conservation Assessment consultant

Individual Analysis: The Water Conservation Assessment performed under this work element (i.e. Water Conservation Assessment #1), and a subsequent Water Conservation Assessment #2 will involve three tasks: Task 1, evaluate existing data, Task 2, determine inefficiencies within each irrigation district (for both conveyance and on-farm), and Task 3, identify measures that could be implemented to reduce or eliminate those inefficiencies. Based on the available budget, it is anticipated that the Water Conservation Assessment #1 will complete Task 1 and part of Task 2, and the Water Conservation Assessment #2 described below will complete Tasks 2 and 3.

Interaction with the Water Resource Model: Each potential water conservation project identified by this work element (e.g., piping or on-farm use reductions) is a water resource alternative that can be packaged into scenarios to be evaluated in the water resource model. As with water resource alternatives identified in other work elements, the BSWG will decide which water resource alternatives should be carried into the water resource model for further evaluation.

3.2.9 Study Element: Water Conservation Assessment #2

Performed by: Farmers Conservation Alliance, funded by Energy Trust of Oregon

Individual Analysis: Funded outside of the Basin Study budget by the Energy Trust of Oregon (est. $1,000,000), this element will further and complete the work done under the Water Conservation Assessment #1 as described above.

Interaction with the Water Resource Model: Similar to the Water Conservation Assessment #1, water resource alternatives identified in this work element can be packaged into scenarios to be evaluated in the water resource model.

3.2.10 Study Element: Reservoir Inflow Forecasting

Performed by: Reclamation and Technical Director

Individual Analysis: Existing inflow forecasting for the Basin's reservoirs are primarily based on old data sets and do not take advantage of recent advances in remote sensing and computer modeling. This work element will evaluate if potential improvements to reservoir inflow forecasting are available, and if so, the degree to which they can allow greater wintertime releases while still ensuring full reservoirs at the start of irrigation season.

Interaction with the Water Resource Model: If the initial individual analysis shows improvements over existing forecasting, and if OWRD is comfortable with the new methodology, then the water resource model can have the chosen inflow forecasting system built into it.

3.2.11 Study Element: Water Rights, Policy, Legal, and Socio-Economic

Performed by: Water Right, Policy, Legal, Socio-Economic consultant(s), Technical Director, and Reclamation

Individual Analysis: This work element will address policy, legal and socio-economic analyses and tools to address the Basin's water supply imbalances, including:

- Evaluate transactional water resource alternatives (opportunities to generate water through leases, transfers related to urbanization, or using incentives like pricing to change behavior or reduce demand)
- Evaluate legal and policy opportunities and impediments related to water resource alternatives evaluated in other work elements.
- Evaluate legal and policy opportunities and impediments related to moving water between uses and users.
- Evaluate economic costs and benefits of water resource alternatives and scenarios.
- Support development and multi-criteria evaluation of scenarios.

Interaction with the Water Resource Model:

- Water resource alternatives identified in this work element can be packaged into scenarios to be evaluated in the water resource model.
- Will inform how water resource alternatives generated in other work elements can be packaged into scenarios to be evaluated in the water resource model.
- Will inform evaluation of water resource scenarios that have been run through the water resource model.

3.2.12 Study Element: Upper Deschutes Ecological Assessment

Performed by: Consultant, Reclamation and Technical Director

Individual Analysis: This work element will evaluate the amount of habitat for redband trout rearing, Oregon spotted frog, and riparian vegetation at a range of streamflows.

Interaction with the Water Resource Model: Results from the initial individual analysis will be used in the water resource model to evaluate the corresponding impacts to habitat and riparian conditions from changes to streamflow due to climate change and water resource scenarios.

3.2.13 Study Element: Middle Deschutes Temperature Assessment

Performed by: UDWC, Reclamation and Technical Director

Individual Analysis: This element will evaluate the impacts of air temperature and streamflow on stream temperatures for Tumalo Creek and the Middle Deschutes River.

Interaction with the Water Resource Model: Stream temperature relationships obtained during the individual analysis will be used in the water resource model to simulate stream temperature of Tumalo Creek and the Middle Deschutes under all flow/climate scenarios. The water resource model will also use a mass balance approach to simulate the temperature of the Middle Deschutes downstream of the confluence.

3.2.14 Study Element: Whychus Temperature Assessment

Performed by: UDWC, Reclamation and Technical Director

Individual Analysis: This element will evaluate the impacts of air temperature and streamflow on stream temperatures.

Interaction with the Water Resource Model: Regression equations obtained during the individual analysis will be used in the water resource model, thereby allowing the model to evaluate the impacts to stream temperature from climate change and water resource scenarios.

3.2.15 Study Element: Crooked River Temperature Assessment

Performed by: CRWC, Reclamation and Technical Director

Individual Analysis: This work element will evaluate the impacts of reservoir elevation, air temperature, and streamflow on stream temperatures downstream of Prineville Reservoir. The team will discuss initial results and determine, with BSWG, whether additional analysis should be done in the Crooked.

Interaction with the Water Resource Model: Similar to the Whychus Temperature Assessment, regression equations obtained during the individual analysis will be used in the water resource model, thereby allowing the model to evaluate the impacts to stream temperature from climate change and water resource scenarios.

3.2.16 Study Element: Water Resource Scenario Development

Performed by: Reclamation, Technical Director, BSWG, Consultant(s)

Individual Analysis: Water resource alternatives will be packaged into water resource scenarios that will be intended to meet multiple needs.

Interaction with the Water Resource Model: Water resource scenarios will be run through the water resource model.

3.2.17 Study Element: Water Resource Model

Performed by: Reclamation and Technical Director

Individual Analysis: An individual analysis will not be completed with the water resource model since it is essentially the tool that brings all the separate parts of the water resource system together. However, before the model will be run with climate or water resource scenarios, it will be run with historical water supply and demand to validate the model.

Interaction with the Water Resource Model: N/A

3.2.18 Study Element: Multi-Criteria Evaluation of Water Management Scenarios

Performed by: Reclamation, Technical Director, BSWG, Consultant(s)

Individual Analysis: This element will evaluate water resource scenarios according to how well they meet water demands, as well as other criteria such as cost, legal feasibility and stakeholder response.

Interaction with the Water Resource Model: This element will use the outputs of the water resource model, in addition to other criteria like cost, legal feasibility and stakeholder response to evaluate water management scenarios.

3.2.19 Recommendations and Implementation Plan

The Basin Study will provide the information necessary for stakeholders to subsequently develop an implementation plan. This step, however, will happen after the Basin Study is complete.

3.3 CHANGE MANAGEMENT

The change management process for the Study is defined in the POS. The change management form to be used is included as Attachment 3 to the PMP. For documentation and record-keeping purposes, approved change management forms will be included in updated versions of the PMP as the Study progresses.

4 SCHEDULE/TIME MANAGEMENT

The BSWG Technical Director and Reclamation Study Lead will track progress on a regular basis and provide a monthly report to the BSWG Planning Team and Reclamation management on schedule status. Monthly status reports will be attached to the PMP as future versions are developed.

4.1 MILESTONES

The table below lists major milestones for this project, along with their estimated completion timeframe.

Milestone	Date
Three-year Basin Study schedule begins	May 5, 2015 (date of MOA execution)
BSWG Study Team contracting completed	August 2015
Study tasks completed	May 2018
Final report prepared	July 2018

4.2 PROJECT SCHEDULE

The project schedule is shown in Attachment 1. Task-specific schedules will be developed and added to the PMP, as appropriate, as task-specific work is initiated.

4.2.1 Dependencies

Key dependencies have been accounted for in the overall Study schedule shown in Attachment 1. The BSWG Coordinator/Technical Director and the Reclamation Study Lead will be responsible for identifying and planning for additional dependencies that may be identified during the Study.

5 COST/BUDGET MANAGEMENT

Expenditures will be tracked on a monthly or more frequent basis. The DBBC/Technical Director and the Reclamation Study Lead will provide a monthly budget status report to the BSWG Planning Team and Reclamation management. Monthly status reports will be attached to the PMP as future versions are developed.

Costs will be tracked against task-level budgets shown in Attachment 1. Any proposed changes to budgets will be managed in accordance with the change management plan.

6 QUALITY MANAGEMENT

Study analyses will be subject to a Technical Sufficiency Review process as defined in the POS. Additional peer reviews will be sought on an interim basis as appropriate and will be documented for consideration during the Technical Sufficiency Review. Consultant products will be subject to the relevant contractor's quality assurance/quality control processes. All major Study documents will be subject to review by the BSWG Planning Team (and, at their discretion, the BSWG Steering Committee) and Reclamation management before being finalized.

7 HUMAN RESOURCE MANAGEMENT

Staffing resources for the BSWG Study Team will be largely associated with contracted technical assistance and will be managed in accordance with those contracts. The

Reclamation Study Lead will work with appropriate managers to plan in advance for staff resource availability and to identify back-up resources wherever possible.

8 COMMUNICATIONS MANAGEMENT

Outward-looking communications will be the responsibility of the Communications Subgroup and will be implemented in accordance with the Communications and Outreach Plan included in the POS. The BSWG Coordinator/Technical Director and the Reclamation Study Lead will be responsible for facilitating Study team communications, including keeping the Planning Team and Reclamation management informed on a timely basis of any key developments, issues, or changes.

9 RISK MANAGEMENT

The risk management process for the Study is defined in the POS. The BSWG Coordinator/Technical Director and the Reclamation Study Lead will be responsible for identifying, tracking, and addressing risks throughout the Study.

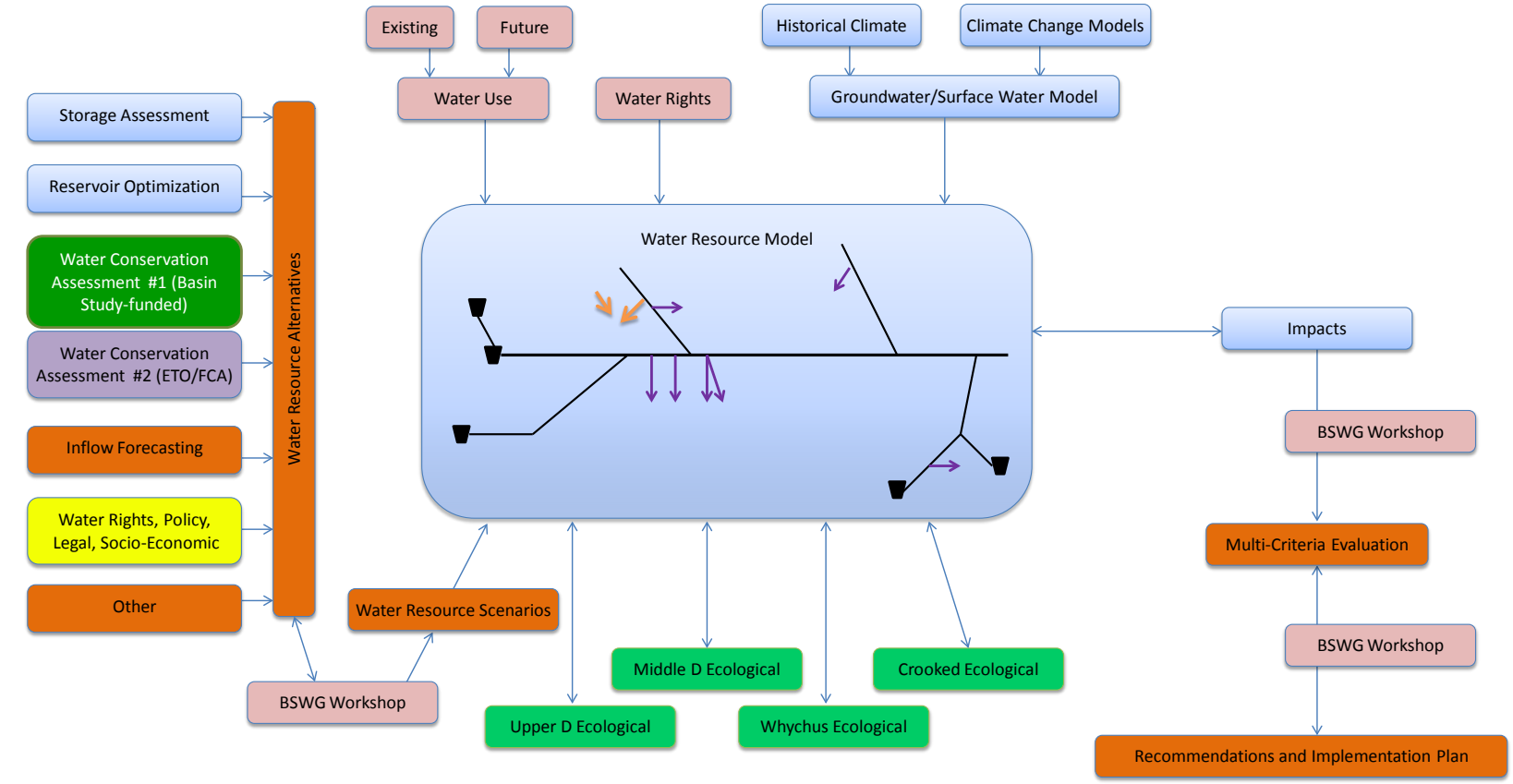
9.1 RISK REGISTER

The risk register is included in Attachment 4. This will be updated with additional risks and current status as the PMP is revised during the progress of the Study.

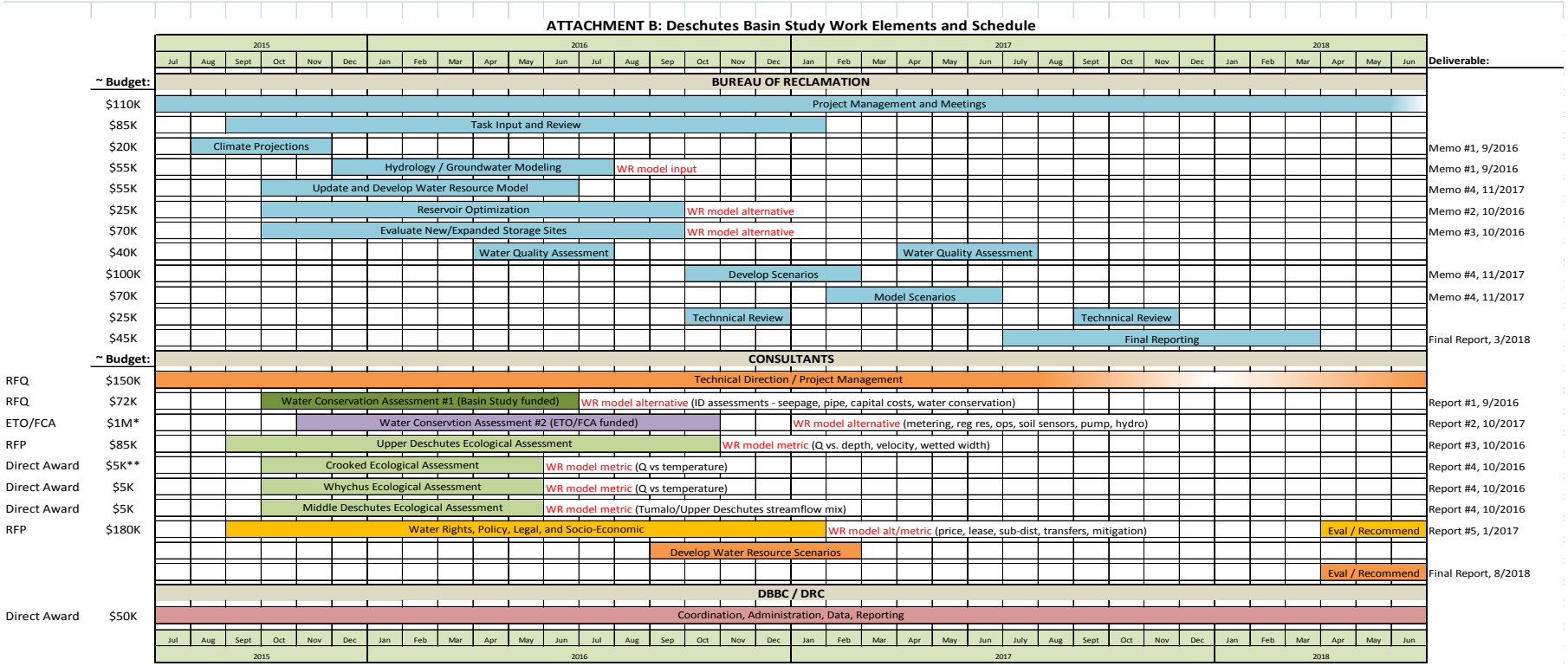
10 PROCUREMENT MANAGEMENT

BSWG/DBBC procurement and contracting will be in accordance with public contracting rules and procedures specifically adopted by DBBC for Study implementation (DBBC Resolution 14-02). For Reclamation tasks not completed by Reclamation staff, procurement will be in accordance with relevant Federal requirements, laws, and regulations. Reclamation may seek assistance via interagency agreement, IDIQ contract task order, and/or other procurement approach as applicable.

ATTACHMENT 1: Study Overview



ATTACHMENT 2: Work Elements and Schedule



Notes:

*: Work to be funded outside of the Basin Study

**: Phase 1 stream temperature assessment is less than $5k. Likely additional Phase 2 work dependent on outcome of Phase 1.

ATTACHMENT 3: CHANGE MANAGEMENT FORM

Upper Deschutes River Basin Study
Change Management Form

Change No:
Description of Change:

Budget Impact ($10K or more)? ☐ Yes ☐ No
Proposed offset or other cost management approach:

Schedule Impact (1 month or more)? ☐ Yes ☐ No
Proposed schedule adjustments to accommodate change:

Reason for Change:
☐ Error/Omission ☐ Field Condition ☐ Project Request ☐ Value Engineering
☐ Other

Reason for change, impacts if not addressed, and alternatives considered:

_____ _____

Submitted by BSWG Coordinator/Technical Lead *Date*

_____ _____

Submitted by Reclamation Study Lead *Date*

_____ _____

Approved by BSWG Planning Team Rep. *Date*

_____ _____

Approved by Bend Field Office Manager *Date*

ATTACHMENT 4: RISK REGISTER 10/8/15 Update

(gray shading indicates completed risk control measures)

Risk No.	Date Initiated	Description	Control Measures	Owner
1	6/5/15	Different water resource interests and/or geographic areas are not representatively addressed in the Basin Study	Develop Plan of Study (POS) as collaborative effort of Steering Committee with all interests/areas represented; key decisions passed through Planning Team (and potentially Steering Committee) via change management process. (*Complete, per BWG-approved POS*)	Niklas C.
2	6/5/15	Early model development steps may consume time and prevent study of interesting options down the line.	Plan schedule to accomplish most tasks in the first two years of the three year study (*Complete, per BSWG-approved POS/schedule*)	Mike R.
3	6/5/15	Budgets may get consumed before interesting tasks are identified.	Retain $50K scope reserve on both the Federal and non-Federal task projections in the POS	Niklas C. & Mike R.
4	6/5/15	Too much of the study budget may get spent on climate change analysis when much of the climate change impacts have already been studied.	Utilize existing studies/data as much as possible to inform and jump-start climate change factors to be incorporated into hydrologic and water resources modeling (e.g., CRBIA study results). (*Complete, per modeling plans incorporated in BSWG-approved POS*)	Jennifer J.
5	6/5/15	Study may emphasize long-term and higher-cost storage projects at expense of development of near-term, more implementable projects.	POS includes the objective to develop two sets of options, one for short-term lower-cost and one for longer-term higher-cost approaches.	Niklas C. & Mike R.
6	6/5/15	Study may overlook long-term and higher-cost storage projects.	POS includes the objective to develop two sets of options, one for short-term lower-cost and one for longer-term higher-cost approaches.	Niklas C. & Mike R.
7	6/5/15	The GSFLOW model may not be ready for use in time to complete the Basin Study on schedule.	Implement a strategy to track GSFLOW status with USGS, assist USGS as possible, and have a back-up approach ready to use on a contingency basis.	Jennifer J.
8	6/5/15	Reclamation staff prove unavailable due to competing work priorities.	Proactively communicate with Reclamation managers to confirm staff availability; identify back-up resources, including TSC/IDIQ alternatives	Mike R.
9	6/5/15	RFQ scopes are not tight enough to appropriately define/constrain contractor work	Address via BSWG input/review of RFQ development; tight coordination between Study Team and Technical Director.	Niklas C.
10	6/5/15	Contractor proposals exceed available budgets	Risk seems likeliest in Upper Deschutes Ecological Assessment; address through negotiation step of contracting strategy by optimizing/prioritizing what can be done; consider spending $25K of contingency (*Complete; $5K added during scoping reviews*)	Niklas C.

11	6/24/15	Funding for FCA/Energy Trust of Oregon work proves unavailable for unforeseen reasons	Contingency plan to address via contractor for Water Conservation SOW; retain at least $50k of scope reserve until ETO signs contract.	Niklas C.
12	6/24/15	Lead times for Reclamation to contract via IDIQ and/or interagency agreement impacts schedules	Identify contracting processes and timelines by August 2015; address in PMP scheduling as appropriate	Mike R.
13	7/8/15	Lack of integration between the various components of the Water Conservation Assessment	Tight coordination between Study Team and Technical Director	Niklas C.
14	7/14/15	Metrics in model are not robust enough to provide meaningful information (hydropower, reliability, ecological and temperature effects)	Assess desired metrics during Task 1 of Legal, Policy, and Economic work element; validate metrics during RiverWare calibration process	Niklas C. & Jennifer J.
15	7/14/15	Spatial scale of RiverWare insufficient to model chosen water management scenarios	Evaluate spatial scale of RiverWare during model setup, optimize between higher resolution RiverWare and modifying water management scenario scales	Niklas C. & Jennifer J.
16	7/14/15	Too much effort is focused on what has been done in the past and not enough on moving existing analyses forward.	Tight coordination between Study Team, BSWG and Technical Director	Niklas C.
17	7/27/15	Schedules for related studies that are outside the Basin Study itself (e.g., ETO/FCA work, Reclamation's Reservoir Operations Pilot Initiative) experience delays that affect the Basin Study schedule	Monitor external schedules monthly; keep contingency funds on hand to address potential shortfalls from other studies	Niklas C., Mike R.
18	9/23/15	Litigation and/or other processes outside of the Basin Study affect scope, schedule, budget for study tasks, and/or the ability of BSWG members to collaborate openly.	Maintain coordination and communication between BSWG, Reclamation, and other relevant entities/individuals to allow early identification of potential issues and collaborative responses	Kate. F, Niklas C., Mike R.